

Parallel lines

Year 7 About 60 minutes No calculator 45 marks



Hints online, answers free with an account:
mathswariz.uk/worksheets/ks3-year-7-parallel-lines/

Date _____

A Do Now

Quick questions to start.

- A1** Needed today [1 mark] **A2** Needed today [1 mark]
 Solve $3x + 25 = 160$. Work out $180 - 53 - 64$.

Answer

Answer

- A3** From chapter 1 [1 mark] **A4** Last lesson [1 mark]
 Work out $(-8) \times (-7)$. Write 60 as a product of prime factors.

Answer

Answer

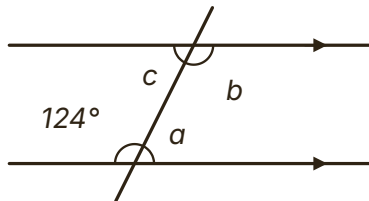
B Example, then your turn

Year 7

Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1

The two lines are parallel. Work out the sizes of angles a , b and c . Give a reason for each.

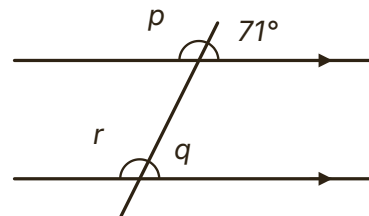


Not drawn accurately

Hint Use one fact at a time: a straight line, then alternate, then corresponding angles.

- B1**
- [3 marks]

The two lines are parallel. Work out the sizes of angles p , q and r . Give a reason for each.

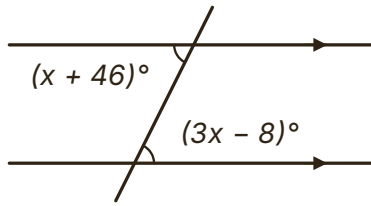


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Answer $p = \dots\dots^\circ$ $q = \dots\dots^\circ$ $r = \dots\dots^\circ$

EXAMPLE 2

The two lines are parallel. Work out the value of x and the size of each marked angle.

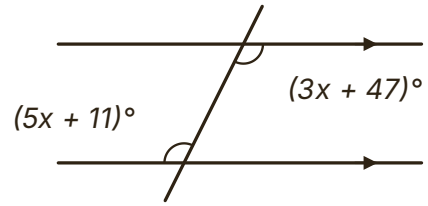


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Hint The angles make a Z shape: they are alternate angles, so they are equal.

B2 The two lines are parallel. [2 marks]

Work out the value of x .

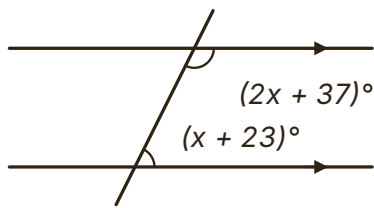


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Answer

EXAMPLE 3

The two lines are parallel. Work out the value of x and the size of each marked angle.

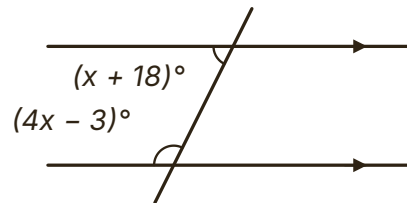


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Hint Both angles are between the lines, on the same side: co-interior (allied) angles add up to 180° .

B3 The two lines are parallel. [3 marks]

Work out the value of x and the size of each marked angle.

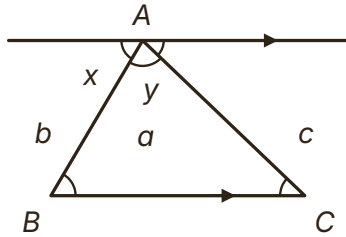


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Answer $x = \dots\dots$ angles $\dots\dots^\circ$ and $\dots\dots^\circ$

EXAMPLE 4

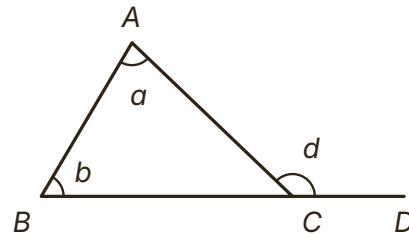
The line through A is parallel to BC . Prove that the angles of triangle ABC add up to 180° : $a + b + c = 180^\circ$.



Not drawn accurately

Hint Find two angles on the line through A that equal b and c .

B4 In triangle ABC the side BC is extended to D . Use the result of the example to prove that the exterior angle d is equal to $a + b$. [3 marks]

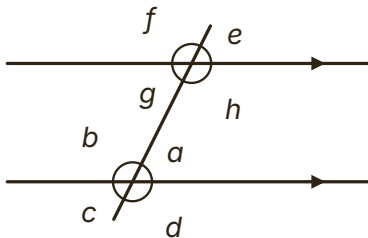


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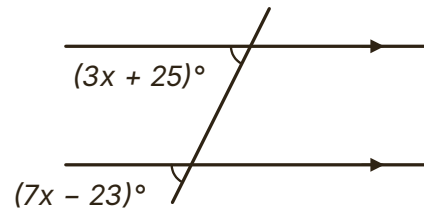
c Practice

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C1 The two lines are parallel. Write down the letter of the angle that is (i) alternate to a , (ii) corresponding to b , (iii) co-interior (allied) with a . [3 marks]



C2 The two lines are parallel. Work out the value of x . [2 marks]

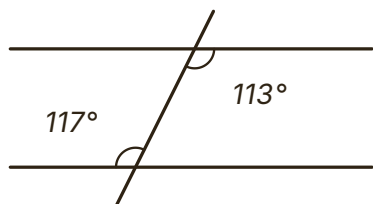


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Answer

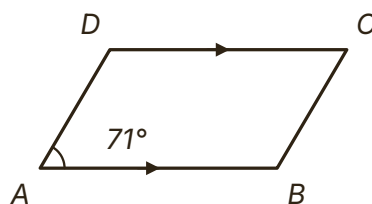
Answer (i) ... (ii) ... (iii) ...

- C3** A straight line crosses two other lines. Are the two lines parallel? [2 marks]
Give a reason for your answer.



Not drawn accurately

- C4** $ABCD$ is a parallelogram. Angle $A = 71^\circ$. Work out the sizes of angles B , C and D . [3 marks]



Not drawn accurately

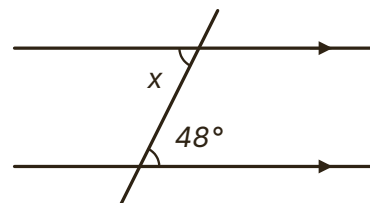
Answer

Answer $B = \dots\dots^\circ$ $C = \dots\dots^\circ$ $D = \dots\dots^\circ$

D Exam-style questions

GCSE Foundation

- D1** The two lines are parallel. Write down the size of the angle marked x . Give a reason for your answer. [2 marks]

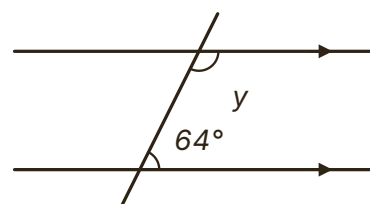


Answer $x = \dots\dots^\circ$

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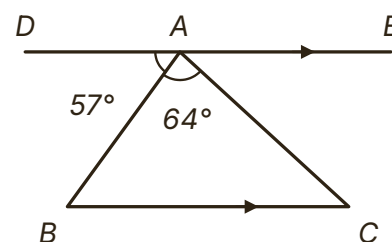
- D2** Leah says, "Angle y is 64° , because alternate angles are equal." [2 marks]

The two lines are parallel. Is Leah correct? Explain your answer.



Not drawn accurately

- D3** DAE is a straight line, parallel to BC . Angle $DAB = 57^\circ$ and angle $BAC = 64^\circ$. Work out the size of angle ACB . Give reasons for your answer. [4 marks]



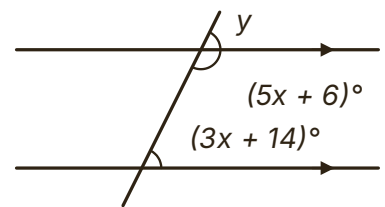
Answer

Not drawn accurately

D4 The two lines are parallel.

(a) Work out the value of x .

[3 marks]



Answer Not drawn accurately

(b) Work out the size of angle y . Give a reason for your answer.

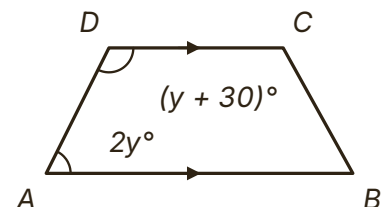
[2 marks]

Answer

Total for D4: 5 marks

D5 $ABCD$ is a trapezium. AB is parallel to DC . Work out the value of y .

[3 marks]



Answer

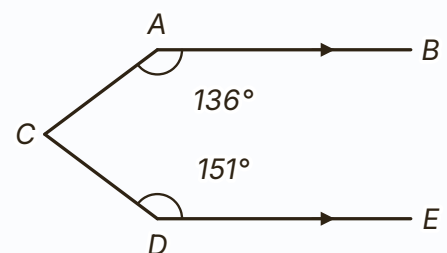
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E Extension

Stretch

No route is given. The hints are at the end of the sheet. Use one at a time.

E1 AB is parallel to DE . Angle $BAC = 136^\circ$ and angle $CDE = 151^\circ$. Work out the size of angle ACD . Give reasons for your working. [4 marks]



Answer

Not drawn accurately

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** Draw a line through C parallel to AB .
Hint 2 The angle between that line and CA is co-interior with 136° , so it is $180 - 136 = 44^\circ$.
Hint 3 The other part is $180 - 151 = 29^\circ$, so angle $ACD = 44 + 29 = 73^\circ$.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

I can spot alternate, corresponding and co-interior (allied) angles. ○ ○ ○

I can find angles at parallel lines and give the reason. ○ ○ ○

I can write and solve an equation from angles at parallel lines. ○ ○ ○